

WHAT IS CLAIMED IS:

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1. A method of registering an IP  
(Internet Protocol) terminal device including a  
function to transmit and receive IP packets, to a  
line-switching exchanger including a database that  
10 is used for managing a type of a telephone set and a  
telephone number thereof, said method comprising the  
steps of:

connecting said line-switching exchanger  
and a network-gateway device by use of a radio-base-  
15 station-connection line that is used for connecting  
radio base stations;

connecting said network-gateway device and  
said IP terminal device through an IP network; and  
20 registering said IP terminal device as a  
radiotelephony device in said database.

25 2. The method as claimed in claim 1,  
further comprising the steps of:

transmitting location-registration  
information of said IP terminal device used for  
registering information about a location of said IP  
30 terminal device to said line switching exchanger  
through said network-gateway device; and

registering location information about  
said IP terminal device in said database based on  
the location-registration information of said IP  
35 terminal device.

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3. A line-switching exchanger provided  
in an IP-terminal-device-registration system,  
wherein said line-switching exchanger is connected  
with a network-gateway device through a radio-base-  
5 station-connection line used for connecting radio  
base stations, said network-gateway device being  
connected through an IP network to an IP terminal  
device that includes a function to transmit and  
receive IP packets, said line-switching exchanger  
10 comprising a database used for managing a type and a  
telephone number of a telephone set, wherein said  
line-switching exchanger registers the IP terminal  
device as a radiotelephony device in said database.

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4. The line-switching exchanger as  
claimed in claim 3, wherein said line-switching  
20 exchanger registers information about a location of  
said IP terminal device based on a location-  
registration-request message supplied from said  
network-gateway device.

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5. The line-switching exchanger as  
claimed in claim 3, wherein said database initially  
30 includes an authentication code for each IP terminal  
device connected to said line-switching exchanger,  
said line-switching exchanger comprising an IP-  
terminal-authentication unit executing  
authentication of said IP terminal device after  
35 receiving a location-registration-request message  
requesting registration of said IP terminal device  
to the database from said network-gateway device, by

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using an authentication code of said IP terminal device corresponding to the location-registration-request message.

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6. The line-switching exchanger as claimed in claim 3, wherein said line-switching  
10 exchanger is a PBX (Private Branch eXchange) device.

15 7. A network-gatekeeper device provided in an IP-terminal-device-registration system, wherein a line-switching exchanger is connected with a network-gateway device through a radio-base-  
20 station-connection line used for connecting radio base stations, and said network-gatekeeper device is connected through an IP network to said network-gateway device and an IP terminal device that includes a function to transmit and receive IP packets, said network-gatekeeper device comprising:  
25 a location-registration-request unit receiving a telephone number and an IP address of said IP terminal device included in an IP-terminal-location-registration-request message that is used for requesting registration of said IP terminal  
30 device from said IP terminal device, and transmitting a location-registration-request message that includes the telephone number to said network-gateway device; and  
a registration-result-notification unit  
35 receiving a result of registering said IP terminal device to said line-switching exchanger from the network-gateway device, and transmitting the result

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to said IP terminal device.

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8. The network-gatekeeper device as claimed in claim 7, wherein said location-registration-request unit receives the IP-terminal-location-registration-request message including an authentication code from said IP terminal device, and transmits the location-registration-request message including said authentication code to said network-gateway device.

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9. The network-gatekeeper device as claimed in claim 7, wherein said location-registration-request unit generates an authentication code based on address information of said IP terminal device when receiving the IP-terminal-location-registration-request message that does not include the authentication code from said IP terminal device, and transmits the location-registration-request message including the generated authentication code to said network-gateway device.

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10. A network-gateway device provided in an IP-terminal-device-registration system, wherein a line-switching exchanger is connected with said network-gateway device through a radio-base-station-connection line used for connecting radio base stations, and a network-gatekeeper device is

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connected through an IP network to said network-gateway device and an IP terminal device that includes a function to transmit and receive IP packets, said network-gateway device comprising:

- 5           a location-registration-request unit  
receiving a first location-registration-request  
message that includes a telephone number of said IP  
terminal device connected to the IP network from  
said network-gatekeeper device, and transmitting a  
10   second location-registration-request message  
including said telephone number to said line-  
switching exchanger; and  
          a registration-result-notification unit  
receiving a result of location registration of said  
15   IP terminal device from said line-switching  
exchanger, and transmitting the result to said  
network-gatekeeper device.

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11. The network-gateway device as claimed  
in claim 10 comprising a memory temporarily storing  
an authentication code of said IP terminal device  
25   when the first location-registration-request message  
received from said network-gatekeeper device  
includes the authentication code of said IP terminal  
device.

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12. The network-gateway device as claimed  
in claim 11 comprising a gateway-arithmetic-  
35   operation unit executing an arithmetic operation  
using the authentication code temporarily stored in  
said memory and an authentication random number

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after receiving the authentication random number from said line-switching exchanger, and transmitting a result of the arithmetic operation to said line-switching exchanger.

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13. An IP terminal device provided in an  
10 IP-terminal-device-registration system wherein a line-switching exchanger is connected with a network-gateway device through a radio-base-station-connection line used for connecting radio base stations, and a network-gatekeeper device is  
15 connected through an IP network to said network-gateway device and said IP terminal device that includes a function to transmit and receive IP packets, said IP terminal device comprising:  
a memory storing an authentication code;  
20 and  
an IP-terminal-location-registration-request unit transmitting an IP-terminal-location-registration-request message including the authentication code therein to said network-  
25 gatekeeper device.

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